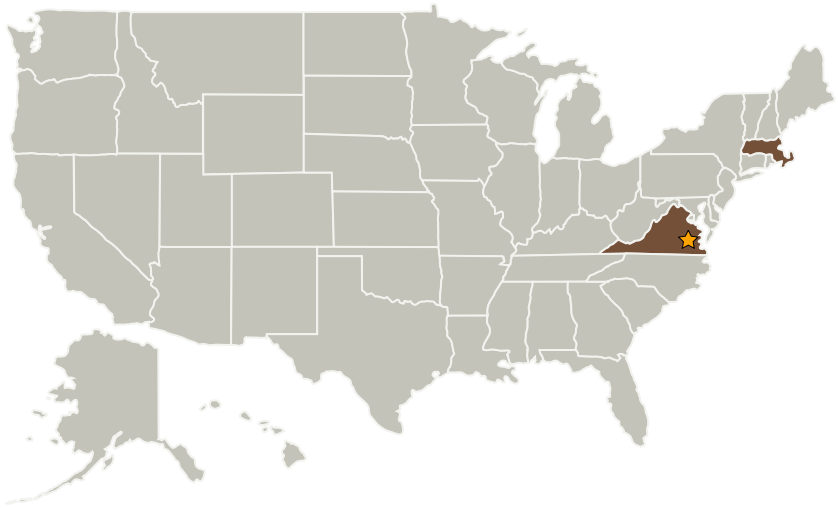
Magneto-Thermography and Hybrid Methods for Composite Life Management, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

This proposed program will focus on life management needs for new and emerging composite material systems and built-up structures in "young" aircraft. Both wide area inspection of fuselage and wing structures and characterization of adhesive bonds in built-up structures are addressed. JENTEK will develop both (1) hybrid methods in which spatially registered, digital images, produced by two or more sensing modalities are combined, and (2) a new method called Magneto-Thermography, invented by JENTEK, which offers both wide area inspection advantages and potential for characterization of adhesive bonds in built-up composite and metal structures. In one implementation of a hybrid method for graphite fiber/epoxy composites, the MWM-Array could sense and locate fiber damage and fiber movement under loads, while thermography could sense both fiber and matrix damage, allowing discrimination between fiber breakage, fiber/matrix disbonding, matrix cracking, and disbonding in built-up structures. Magneto-Thermography will use the demonstrated capability of the MWM-Array to monitor temperatures of buried fibers and to monitor temperatures at buried interfaces to replace IR cameras with MWM-Arrays in thermographic methods. This will enable both wide area inspection of thick composites and enhanced characterization of adhesive bonds in built-up structures, for foam layers, and other aerospace and space applications.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
JENTEK Sensors, Inc.	Supporting Organization	Industry	Waltham, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.5 Electromagnetic Wave Based Sensors